



#3

1

Docket No. SPO-115C1

## SEQUENCE LISTING

<110> Fukuda, Atsunori  
Tanaka, Yoshiyuki

<120> Sodium/Proton Antiporter Gene

<130> SPO-115C1

<140> 09/888,035

<141> 2001-06-22

<150> JP 1998-365604

<151> 1998-12-22

<160> 2

<170> PatentIn version 3.1

<210> 1

<211> 2330

<212> DNA

<213> Oryza sativa

<220>

<221> CDS

<222> (297)..(1901)

<223>

<400> 1  
gagaagagag ttttgtagcg agctcgcgcg aatgcgaagc caaccgagag aggtctcgat 60  
accaaattccc gattttctcaa cctgaatccc cccccacgt tcctcgtttc aatctgttcg 120  
tctgcgaatc gaattctttg tttttttttc tctaatttta ccgggaattg tcgaattagg 180  
cattcaccaa cgagcaagag gggagtggat tggttggta aagctccgca tcttgccggc 240  
gaaatctcgc tctcttctct gcggtgggtg gccggagaag tcgccgccgg tgaggc atg 299  
Met  
1

ggg atg gag gtg gcg gcg gcg cgg ctg ggg gct ctg tac acg acc tcc 347  
Gly Met Glu Val Ala Ala Ala Arg Leu Gly Ala Leu Tyr Thr Thr Ser  
5 10 15

gac tac gcg tcg gtg gtg tcc atc aac ctg ttc gtc gcg ctg ctc tgc 395  
Asp Tyr Ala Ser Val Val Ser Ile Asn Leu Phe Val Ala Leu Leu Cys  
20 25 30

gcc tgc atc gtc ctc ggc cac ctc ctc gag gag aat cgc tgg gtc aat 443  
Ala Cys Ile Val Leu Gly His Leu Leu Glu Glu Asn Arg Trp Val Asn  
35 40 45

gag tcc atc acc gcg ctc atc atc ggg ctc tgc acc ggc gtg gtg atc 491  
 Glu Ser Ile Thr Ala Leu Ile Ile Gly Leu Cys Thr Gly Val Val Ile  
 50 55 60 65

ttg ctg atg acc aaa ggg aag agc tcg cac tta ttc gtc ttc agt gag 539  
 Leu Leu Met Thr Lys Gly Lys Ser Ser His Leu Phe Val Phe Ser Glu  
 70 75 80

gat ctc ttc ttc atc tac ctc ctc cct ccg atc atc ttc aat gca ggt 587  
 Asp Leu Phe Phe Ile Tyr Leu Leu Pro Pro Ile Ile Phe Asn Ala Gly  
 85 90 95

ttt cag gta aag aaa aag caa ttc ttc cgg aat ttc atg acg atc aca 635  
 Phe Gln Val Lys Lys Lys Gln Phe Phe Arg Asn Phe Met Thr Ile Thr  
 100 105 110

tta ttt gga gcc gtc ggg aca atg ata tcc ttt ttc aca ata tct att 683  
 Leu Phe Gly Ala Val Gly Thr Met Ile Ser Phe Phe Thr Ile Ser Ile  
 115 120 125

gct gcc att gca ata ttc agc aga atg aac att gga acg ctg gat gta 731  
 Ala Ala Ile Ala Ile Phe Ser Arg Met Asn Ile Gly Thr Leu Asp Val  
 130 135 140 145

gga gat ttt ctt gca att gga gcc atc ttt tct gcg aca gat tct gtc 779  
 Gly Asp Phe Leu Ala Ile Gly Ala Ile Phe Ser Ala Thr Asp Ser Val  
 150 155 160

tgc aca ttg cag gtc ctc aat cag gat gag aca ccc ttt ttg tac agt 827  
 Cys Thr Leu Gln Val Leu Asn Gln Asp Glu Thr Pro Phe Leu Tyr Ser  
 165 170 175

ctg gta ttc ggt gaa ggt gtt gtg aac gat gct aca tca att gtg ctt 875  
 Leu Val Phe Gly Glu Gly Val Val Asn Asp Ala Thr Ser Ile Val Leu  
 180 185 190

ttc aac gca cta cag aac ttt gat ctt gtc cac ata gat gcg gct gtc 923  
 Phe Asn Ala Leu Gln Asn Phe Asp Leu Val His Ile Asp Ala Ala Val  
 195 200 205

gtt ctg aaa ttc ttg ggg aac ttc ttt tat tta ttt ttg tcg agc acc 971  
 Val Leu Lys Phe Leu Gly Asn Phe Phe Tyr Leu Phe Leu Ser Ser Thr  
 210 215 220 225

ttc ctt gga gta ttt gct gga ttg ctc agt gca tac ata atc aag aag 1019  
 Phe Leu Gly Val Phe Ala Gly Leu Leu Ser Ala Tyr Ile Ile Lys Lys  
 230 235 240

cta tac att gga agg cat tct act gac cgt gag gtt gcc ctt atg atg 1067  
 Leu Tyr Ile Gly Arg His Ser Thr Asp Arg Glu Val Ala Leu Met Met  
 245 250 255

ctc atg gct tac ctt tca tat atg ctg gct gag ttg cta gat ttg agc 1115  
 Leu Met Ala Tyr Leu Ser Tyr Met Leu Ala Glu Leu Leu Asp Leu Ser  
 260 265 270

ggc att ctc acc gta ttc ttc tgt ggt att gta atg tca cat tac act 1163  
 Gly Ile Leu Thr Val Phe Phe Cys Gly Ile Val Met Ser His Tyr Thr  
 275 280 285

tgg cat aac gtc aca gag agt tca aga gtt aca aca aag cac gca ttt 1211  
 Trp His Asn Val Thr Glu Ser Ser Arg Val Thr Thr Lys His Ala Phe  
 290 295 300 305

gca act ctg tcc ttc att gct gag act ttt ctc ttc ctg tat gtt ggg 1259  
 Ala Thr Leu Ser Phe Ile Ala Glu Thr Phe Leu Phe Leu Tyr Val Gly  
 310 315 320

atg gat gca ttg gat att gaa aaa tgg gag ttt gcc agt gac aga cct 1307  
 Met Asp Ala Leu Asp Ile Glu Lys Trp Glu Phe Ala Ser Asp Arg Pro  
 325 330 335

ggc aaa tcc att ggg ata agc tca att ttg cta gga ttg gtt ctg att 1355  
 Gly Lys Ser Ile Gly Ile Ser Ser Ile Leu Leu Gly Leu Val Leu Ile  
 340 345 350

gga aga gct gct ttt gta ttc ccg ctg tcg ttc ttg tcg aac cta aca 1403  
 Gly Arg Ala Ala Phe Val Phe Pro Leu Ser Phe Leu Ser Asn Leu Thr  
 355 360 365

aag aag gca ccg aat gaa aaa ata acc tgg aga cag caa gtt gta ata 1451  
 Lys Lys Ala Pro Asn Glu Lys Ile Thr Trp Arg Gln Gln Val Val Ile  
 370 375 380 385

tgg tgg gct ggg ctg atg aga gga gct gtg tcg att gct ctt gct tac 1499  
 Trp Trp Ala Gly Leu Met Arg Gly Ala Val Ser Ile Ala Leu Ala Tyr  
 390 395 400

aat aag ttt aca aga tct ggc cat act cag ctg cac ggc aat gca ata 1547  
 Asn Lys Phe Thr Arg Ser Gly His Thr Gln Leu His Gly Asn Ala Ile  
 405 410 415

atg atc acc agc acc atc act gtc gtt ctt ttt agc act atg gta ttt 1595  
 Met Ile Thr Ser Thr Ile Thr Val Val Leu Phe Ser Thr Met Val Phe  
 420 425 430

ggg atg atg aca aag cca ttg atc agg ctg ctg cta ccg gcc tca ggc 1643  
 Gly Met Met Thr Lys Pro Leu Ile Arg Leu Leu Leu Pro Ala Ser Gly  
 435 440 445

cat cct gtc acc tct gag cct tca tca cca aag tcc ctg cat tct cct 1691  
 His Pro Val Thr Ser Glu Pro Ser Ser Pro Lys Ser Leu His Ser Pro  
 450 455 460 465

ctc ctg aca agc atg caa ggt tct gac ctc gag agt aca acc aac att 1739  
 Leu Leu Thr Ser Met Gln Gly Ser Asp Leu Glu Ser Thr Thr Asn Ile  
 470 475 480

gtg agg cct tcc agc ctc cgg atg ctc ctc acc aag ccg acc cac act 1787  
 Val Arg Pro Ser Ser Leu Arg Met Leu Leu Thr Lys Pro Thr His Thr  
 485 490 495



Gly Phe Gln Val Lys Lys Lys Gln Phe Phe Arg Asn Phe Met Thr Ile  
 100 105 110

Thr Leu Phe Gly Ala Val Gly Thr Met Ile Ser Phe Phe Thr Ile Ser  
 115 120 125

Ile Ala Ala Ile Ala Ile Phe Ser Arg Met Asn Ile Gly Thr Leu Asp  
 130 135 140

Val Gly Asp Phe Leu Ala Ile Gly Ala Ile Phe Ser Ala Thr Asp Ser  
 145 150 155 160

Val Cys Thr Leu Gln Val Leu Asn Gln Asp Glu Thr Pro Phe Leu Tyr  
 165 170 175

Ser Leu Val Phe Gly Glu Gly Val Val Asn Asp Ala Thr Ser Ile Val  
 180 185 190

Leu Phe Asn Ala Leu Gln Asn Phe Asp Leu Val His Ile Asp Ala Ala  
 195 200 205

Val Val Leu Lys Phe Leu Gly Asn Phe Phe Tyr Leu Phe Leu Ser Ser  
 210 215 220

Thr Phe Leu Gly Val Phe Ala Gly Leu Leu Ser Ala Tyr Ile Ile Lys  
 225 230 235 240

Lys Leu Tyr Ile Gly Arg His Ser Thr Asp Arg Glu Val Ala Leu Met  
 245 250 255

Met Leu Met Ala Tyr Leu Ser Tyr Met Leu Ala Glu Leu Leu Asp Leu  
 260 265 270

Ser Gly Ile Leu Thr Val Phe Phe Cys Gly Ile Val Met Ser His Tyr  
 275 280 285

Thr Trp His Asn Val Thr Glu Ser Ser Arg Val Thr Thr Lys His Ala  
 290 295 300

Phe Ala Thr Leu Ser Phe Ile Ala Glu Thr Phe Leu Phe Leu Tyr Val  
 305 310 315 320

Gly Met Asp Ala Leu Asp Ile Glu Lys Trp Glu Phe Ala Ser Asp Arg  
 325 330 335

Pro Gly Lys Ser Ile Gly Ile Ser Ser Ile Leu Leu Gly Leu Val Leu  
 340 345 350

Ile Gly Arg Ala Ala Phe Val Phe Pro Leu Ser Phe Leu Ser Asn Leu  
 355 360 365

Thr Lys Lys Ala Pro Asn Glu Lys Ile Thr Trp Arg Gln Gln Val Val  
 370 375 380

Ile Trp Trp Ala Gly Leu Met Arg Gly Ala Val Ser Ile Ala Leu Ala  
 385 390 395 400

Tyr Asn Lys Phe Thr Arg Ser Gly His Thr Gln Leu His Gly Asn Ala  
 405 410 415

Ile Met Ile Thr Ser Thr Ile Thr Val Val Leu Phe Ser Thr Met Val  
 420 425 430

Phe Gly Met Met Thr Lys Pro Leu Ile Arg Leu Leu Leu Pro Ala Ser  
 435 440 445

Gly His Pro Val Thr Ser Glu Pro Ser Ser Pro Lys Ser Leu His Ser  
 450 455 460

Pro Leu Leu Thr Ser Met Gln Gly Ser Asp Leu Glu Ser Thr Thr Asn  
 465 470 475 480

Ile Val Arg Pro Ser Ser Leu Arg Met Leu Leu Thr Lys Pro Thr His  
 485 490 495

Thr Val His Tyr Tyr Trp Arg Lys Phe Asp Asp Ala Leu Met Arg Pro  
 500 505 510

Met Phe Gly Gly Arg Gly Phe Val Pro Phe Ser Pro Gly Ser Pro Thr  
 515 520 525

Glu Gln Ser His Gly Gly Arg  
 530 535